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| 10/518,636 | 09/13/2005 | Christoph Baumhof | BAUMHOF I | 4945 |
| 1444 7590 08/09/2007 BROWDY AND NEIMARK, P.L.L.C. 624 NINTH STREET, NW SUITE 300 WASHINGTON, DC 20001-5303 | | | EXAMINER BATICH, DENNIS P | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/518,636

Applicant(s)

BAUMHOF ET AL.

Examiner

Dennis P. Batich

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2169

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10 - 17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10 - 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed on April 26, 2007. The applicant's arguments and amendments have been carefully and respectfully considered as set forth below.
2. In response to the non-final Office Action of February 1, 2007, the specification, abstract, and claims have been amended. As a result, claims 10 to 17 are pending.
3. The objection to the abstract under MPEP § 608.01 has been withdrawn subsequent to the amendment as submitted on April 26, 2007.
4. The objection to the specification under MPEP § 608.01 has been withdrawn subsequent to the amendment as submitted on April 26, 2007.
5. The rejections of claims 10 through 17 under 35 U.S.C 112, second paragraph are withdrawn subsequent to the amendment as submitted on April 26, 2007.
6. The rejections of claims 10 through 17, under 35 U.S.C. 101 are withdrawn subsequent to the amendment as submitted on April 26, 2007.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 10 – 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Larner, et al. (US 6,104,638 hereinafter Larner et al. '638).

In reference to claim 10, Larner et al. '638 teaches a method for restoring administrative data records of a nonvolatile memory that can be written in units of sectors and erased in units of blocks, said records being stored in a more rapidly accessible internal volatile flag memory of an assigned memory controller, the method comprising the steps of:

- a) **Setting up in one or more memory blocks of the nonvolatile memory a contiguous reconstruction table (RKT)** as parameters that are contiguously stored in nonvolatile memory containing an identification field with the first two bits of which specifying the length of the data field, and an optional second field specifying data field length, and the actual data field (column 2 lines 45 to 60) as stored in non-volatile memory. Each parameter representing a data record with two or three fields per record, and by contiguously storing the parameters thereby creating a table of records. This table is purposefully used in the advent of power failure to

reconstruct in RAM: the locations of data in nonvolatile memory, or to reconstruct the locations of data in nonvolatile memory for recovery to RAM and the recovery of data to RAM. Furthermore Larner et al. '638 teaches that the data structure may incorporate the use of pointers or references and/or the use of a lookup/hash table (column 3 lines 54 to 64). This data structure would be used for reconstruction of information due to power failure.

- b) **Continually updating the reconstruction table with records of all write and erase operations in the nonvolatile memory out of the internal flag memory** as a parameter is updated or each time a new segment is written the parameter with its latest value is written to non-volatile memory (column 4 lines 16 to 18), **the step of continually updating comprising recording all information with which the administrative data records of the internal flag memory of the memory controller can be completely reconstructed in each case during a restart after a power failure** as each time a segment becomes full (or when a predetermined threshold is reached) the most recent values as stored in RAM are copied into an unused segment of non-volatile memory (column 4 lines 1 to 6), and as a parameter is updated or each time a new segment is written the parameter with its latest value is written to non-volatile memory (column 4 lines 16 to 18). These parameters are

used to reconstruct in RAM the layout of the nonvolatile memory storage (column 4 lines 13 to 39).

- c) **Starting a reconstruction when a predefined fill level of the reconstruction table (RKT) is reached in each case to create a defined initial state of the administrative data records in the flag memory and in the reconstruction table (RKT) as segments that contain reconstruction information for defining an initial state of memory become full or reach a predetermined threshold they are recycled, and updates of both written and erased data are reorganized and stored in a nonvolatile memory (column 3 line 66 to column 4 line 27), and recording the start of the reconstruction as a last entry OE in the reconstruction table as an FFFF found by the firmware in a location where a parameter ID should have been found, indicates that the end of the records has been reached (in column 3 lines 44 to 47). Since data is written in segments this would also indicate the end of the segment and hence the start of a new reorganized segment. The examiner notes the applicant's invention is similar in that the last entry is the OE entry, which signifies the table is fully complete – there are no more records, and a new table reorganization may have started.**

In reference to claim 11, Larner et al. '638 teaches all of claim 10 and further teaches **that every entry in the reconstruction table (RKT) is one sector or one sector**

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segment long as segments are written into flash memory. Larner et al. '638 teaches working with data structures in column 3, lines 59 – 62 and also details working with segments as for example in column 1, starting on line 47, he writes, "... segmented flash memory is used, in which individual segments can be erased," and on line 57, "When a new segment is written, the new segment is written using the values from RAM."

In reference to claim 12, Larner et al. '638 teaches all of claim 10 and further teaches **the reconstruction of the administrative data records of the flag memory is repeated if another power failure has occurred during the reconstruction of the data records** as in the event of power failure provision is made to ensure that no data is lost during the transfer of data from one memory segment to another or during the writing of data (column 2 line 40) and in column 4 line 58 to column 5 line 22 where the recovery of RAM memory from nonvolatile memory is detailed.

In reference to claim 13, Larner et al. '638 teaches all of claim 10 and further teaches **that every time the reorganization was successful, a completion entry (FE) takes place in the reconstruction table, said completion entry containing a counter (FZ), which is incremented with every completion entry** as a reorganization counter (column 4 on lines 52 – 56). Larner et al. '638 also teaches that the first entry (the counter) serves a dual purpose. In addition to counting, the first value of the segment is examined if the value is other than FFFF then the segment is complete and valid. In the

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event more than one segment contains an entry the lower segment is selected. These completion determinations are based on the first entry in the table (column 4 line 64 to column 5 line 11). The examiner notes that the applicant's specification also relies on the counter in the exact same way as Larner et al. '638 in the event of a power failure.

In reference to claim 14, Larner et al. '638 teaches all of claim 13 and further teaches **that for the renewed creation of the reconstruction table (RKT) after a successful reorganization, the previously used memory blocks are released for erasing in a background program and a still erased blocks are initialized accordingly as** previously used memory blocks are erased and reused (column 4, lines 1 – 12). Larner also teaches us that these memory areas are initialized as exemplified in column 2, lines 29 – 31.

In reference to claim 15, Larner et al. '638 teaches all of claim 14 and further teaches **that as that the first entry in a reconstruction table (RKT) is a completion entry (FE)** as the first value of the segment is examined if the value is other than FFFF then the segment is complete and valid. In the event more than one segment contains an entry the lower segment is selected. These completion determinations are based on the first entry in the table (column 4 line 64 to column 5 line 11). The examiner notes that the applicant's specification also relies on the counter in the exact same way as Larner et al. '638 in the event of a power failure.

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In reference to claim 16, Larner et al. '638 teaches all of claim 10 and further teaches **that, as a portion of the administrative data records, a table (ZZT) is maintained in the flag memory for any invalid block pointers that are contained in a block pointer table (BZT) in the nonvolatile memory** as a memory map of known defective locations for specific segments is maintained as a record in non-volatile memory and also in RAM (column 6 lines 1 – 9) and the use of pointers to identify locations in non-volatile memory (column 3 lines 54 to 56).

In reference to claim 17, Larner et al. '638 teaches all of claim 16 and further teaches **that during the reorganization the block pointer table (BZT) is updated in each case with aid of the table (ZZT) for invalid block pointers** as a memory map of known defective locations for specific segments is maintained as a record in non-volatile memory and also in RAM. The memory map is referenced through one of the parameters, which are updated in RAM (column 6 lines 1 – 9). The use of pointers are specified to identify locations in non-volatile memory (column 3 lines 54 to 56).

Response to Arguments

9. Applicant's arguments filed on April 26, 2007 have been fully considered but they are not persuasive, please see above amended claim rejections. The examiner finds regarding that the issue of:

- a) **The present application claims a separate memory control apart from the host. Larner specifies only a processor 100, which is not a**

separate memory controller. See amended rejection for claim 1.

Additionally, Larner et al. '638 does not specify that his processor is a host. The processor appears to be an element of a microcontroller for facilitating memory control software typically stored within firmware.

- b) **Applicant respectfully submits that Larner is not the same as the present claim invention for at least the following reasons.**

Additionally, according to column 2, lines 61 et seq., Larner keeps a table with parameters of the application like serial numbers, loads count, and hours of use as maintenance data, not a table of memory operations such as write and erase operations on the blocks of non-volatile memory. This administrative data is not within the scope of device taught by Larner. Applicant is directed to column 3 lines 54 to 65 where Larner et al. '638 anticipates the use of indirect references to memory through a data structure such as a lookup (possibly a hash table) table. The examiner believes Larner et al. '638 only uses the above data as an example of data that can be stored. Clearly, if one only wants to store only read/write data this is an alternative possibility. Larner et. al. '638 does store read/write information in non-volatile memory. Each parameter specifies the location of the data within each record as stored within the non-volatile memory. The parameter must be examined in order to recover the written data from its location in non-volatile memory.

Also, in column 4 lines 61 to 62, "for some variable length parameters, RAM may contain a pointer to a location in non-volatile memory."

- c) **Fig. 1. of Larner only shows a general structure of a flash memory, not the structure of the reconstruction table provided by Applicant's invention.** See b) of the response to arguments and also 1a). The examiner agrees that the applicant's table is not exactly the same as Larner et al. 638's table, however as applicant's broadly claimed the limitation, it reads on Larner et al. 638's invention.
- d) **Further, Larner does not teach that the construction table is brought into an initial definite state of the administrative data records. Larner teaches only that the parameters in the tables in RAM and flash memory are brought to the same current values. This is not an initial definite state, as recited in claim 10.** Examiner believes both are brought to an initial definite state as stated in claim 10 when a predefined fill level is reached (column 3 line 66 to column 4 line 7). The old segment is not erased until the new segment is written. The new segment contains the most current state (if power was lost this segment would then define the initial state for RAM) or the initial definite state for both RAM and non-volatile memory. Also, Larner et al. '638 specifically states that when the old segment is erased all words are set to the hex value of FFFF (column 5 line 57 to 58). So the initial definite state of an erased segment is FFFF, which is a special value.

- e) Further, Larner shows no special last entry in the table, indicating a start of a reconstruction. Only sequence numbers are used, which are counted continually. The first entry in table is checked if entries are corrupted due to a power failure. This is different than Applicant's claimed invention in which the start of the reconstruction process is recorded as the last entry in the table.

Larner et al. '638 uses FFFF as a special last entry. When FFFF is found in the field where a parameter should reside it signifies a completed table, there are no more records to be found. This is true for both Larner et al. '638 and the applicant, since the writing is done for an entire segment at one time. For either one the table is now complete with the special last entry made (see limitation 1h above).

Conclusion

Applicant's arguments filed April 26, 2007 been fully considered but they are not persuasive. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis P. Batich whose telephone number is 571-270-1755. The examiner can normally be reached on Monday-Friday, 7:30am-5:00pm est alt Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christian Chace can be reached on 571-272-4190. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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July 22, 2007


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